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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,385	04/01/2004	Feng-Wen Sun	PD-203051	9374
7590 The DIRECTV Group, Inc. RE/R11/A109 P.O. Box 956 El Segundo, CA 90245-0956				
EXAMINER				
HAILU, KIBROM T				
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2616				
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09/30/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/816,385

**Applicant(s)**

SUN ET AL.

**Examiner**

KIBROM T. HAILU

**Art Unit**

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-21, 50 and 51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21, 50 and 51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04/01/2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/888)
- Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. The previous office action is withdrawn and herein a new ground of rejection is provided.

#### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claims 1, 4, 9, 11-12, 15 and 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christodoulides et al. (US 6,665,361 B1) in view of Raleigh et al. (US 6,158,041), and further in view of Kuznicki (US 5,282,205).

**Regarding claims 1 and 4**, Christodoulides discloses a method for supporting frame synchronization in a digital communication system (col. 4, lines 16-19), the method comprising the steps of: mapping a codeword specifying framing information of a frame according to a signal constellation to output a data stream (Fig. 5; col. 5, lines 43-48, 56-58); duplicating and demultiplexing the data stream into a first data stream and a second data stream (col. 5, line 66-col. 6, line 6); and outputting a physical layer signaling header corresponding to the frame based

on the multiplexed data streams (col. 1, lines 61-67; col. 4, lines 1-6; col. 5, lines 51-52; col. 5, line 66-col. 6, line 10).

Christodoulides doesn't disclose codeword, modifying the first data stream according to a predetermined operation; multiplexing the modified first data stream with the second data stream; and outputting a physical layer signaling header corresponding to the frame based on the multiplexed data streams.

Raleigh teaches modifying the first data stream according to a predetermined operation (Fig. 2; col. 4, lines 61-64, illustrates the first data stream is modified by multiplying the value  $i$  by the multiplier 222); multiplexing the modified first data stream with the second data stream (Fig. 2; col. 4, line 65-col. 5, line 1; explains the first data stream modified by multiplier 222 and the second data stream are combined or multiplexed by the summer 224 and the combined output is interleaved by interleaver).

Raleigh doesn't teach codeword for frame information.

Kuznicki teaches a codeword specifying frame information (col. 6, lines 24-37, 52-56).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate codeword to specify frame information, modifying first data stream by multiplying a constant value and combine the modified first data stream with the second data stream outputted from the constellation map element as taught by Kuznicki and Raleigh into the satellite communication of Christodoulides in order to be able to reconfigure the amount of information which can be transmitted on the channel within the available transmission frames that maximizes message throughput on the channel, and the decoder would not be overwhelmed with successive errors, thus optimize performance and avoid degrading the system.

**Regarding claim 9**, Christodoulides discloses scrambling the multiplexed data streams (col. 4, lines 3-6).

**Regarding claims 11, 12 and 15**, the same rejections to claims 1 and 4 are applicable hereto. The claims are just mere reformulation of claim 1 and 4 in order to define the corresponding computer-readable medium and apparatus.

**Regarding claims 50 and 51**, Christodoulides discloses the data stream includes a unique word to assist with synchronization (col. 4, lines 16-19).

5. Claims 2, 10, 13 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christodoulides in view of Raleigh and Kuznicki, as applied to claims 1 and 12 above, further in view of Pautler et al. (US 6,859,503 B2).

The satellite communication of Christodoulides discloses the signal constellation depends on or according to 16QAM modulation scheme. However, Christodoulides doesn't disclose the signal constellation is independent of a modulation scheme of the frame (col. 4, lines 12-19; col. 5, lines 17-21, 46-48; col. 9, lines 48-55).

Pautler teaches the signal constellation is independent of a modulation scheme of the frame (col. 13, lines 63-67, explains the constellation can be any of the modulation schemes BPSK, QPSK, M-PSK, and M-QUAM).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate any of the above specified modulation scheme (i.e. the signal constellation independent of the modulation schemes) as taught by Pautler into the modified satellite communication of Christodoulides in order to transmit and receive data streams in different rates, thus efficiently control the transmission.

6. Claims 3 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christodoulides in view of Raleigh and Kuznicki, as applied to claims 1 and 12 above, further in view of Mogre et al. (US 2004/0047433 A1).

Christodoulides discloses a frame format for satellite communication (abstract).

Christodoulides doesn't disclose the frame is a Low Density Parity Check (LDPC) coded frame.

Mogre teaches the frame is a Low Density Parity Check (LDPC) coded frame (paragraph [0018]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use LDPC frame format of Mogre in the modified satellite communication of Christodoulides to efficiently transmit broadband service content using the LDPC that may operate efficiently and effectively using preexisting bandwidth allocated, and avoid attenuation problems when broadcast at preexisting transmission power level.

7. Claims 5, 6 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christodoulides in view of Raleigh and Kuznicki, and further in view of Gardner (US 5,627,499).

Christodoulides discloses a method for supporting frame synchronization in a digital communication system (col. 4, lines 16-19), the method comprising the steps of: mapping a unique word specifying framing information of a frame according to a signal constellation to output a data stream (Fig. 5; col. 5, lines 43-48, 56-58); duplicating and demultiplexing the data stream into a first data stream and a second data stream (col. 5, line 66-col. 6, line 6); and outputting a physical layer signaling header corresponding to the frame based on the multiplexed

data streams (col. 1, lines 61-67; col. 4, lines 1-6; col. 5, lines 51-52; col. 5, line 66-col. 6, line 10).

Christodoulides doesn't disclose codeword, modifying the first data stream according to a predetermined operation; multiplexing the modified first data stream with the second data stream; and outputting a physical layer signaling header corresponding to the frame based on the multiplexed data streams.

Raleigh teaches modifying the first data stream according to a predetermined operation (Fig. 2; col. 4, lines 61-64, illustrates the first data stream is modified by multiplying the value  $i$  by the multiplier 222); multiplexing the modified first data stream with the second data stream (Fig. 2; col. 4, line 65-col. 5, line 1; explains the first data stream modified by multiplier 222 and the second data stream are combined or multiplexed by the summer 224 and the combined output is interleaved by interleaver).

Raleigh doesn't teach codeword, the sign of the multiplier represents a portion of the framing information, bits of the first data stream are interleaved with respective additional bits, the additional bits being phase rotated relative to the bits of the first data stream during modulation.

Kuznicki teaches mapping a codeword specifying frame information (col. 6, lines 24-37, 52-56).

Gardner teaches the sign of the multiplier represents a portion of the framing information, bits of the first data stream are interleaved with respective additional bits, the additional bits being phase rotated relative to the bits of the first data stream during modulation (Figs. 2 and 3; col. 4, lines 31-59, illustrates "...the effect of adding multiple 90 degrees to the 8-bit digital

representation of the in-phase...bit in the shift register is a logical one, the counter increments the phase by 90 degrees. Alternatively, when the oldest bit in the shift register is a logical zero, the counter decrements the phase by 90 degrees, and rotating the bits by multiples of 90 degrees).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use modifying first data stream by multiplying a constant value, combine the modified first data stream with the second data stream outputted from the constellation map element, mapping codeword for frame information the sign representing frame information and rotating the bits by multiples of 90 degrees as taught by Raleigh, Kuznick and Gardner into the satellite communication of Christodoulides in order to be able to reconfigure the amount of information which can be transmitted on the channel within the available transmission frames that maximizes message throughput on the channel, to reduce size and cost of a circuit, and the decoder would not be overwhelmed with successive errors, thus optimize performance and avoid degrading the system.

8. Claims 7 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christodoulides in view of Raleigh and Kuznicki, as applied to claims 1 and 12 above, further in view of Kim et al. (US 6,851,085 B2).

Christodoulides discloses generating the codeword or unique word according to turbo or convolutional code. However, Christodoulides doesn't disclose generating the codeword according to a first order Reed-Muller code.

Kim teaches generating the codeword according to a first order Reed-Muller code (col. 2, lines 24-36).



Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the first order Reed-Muller code to generate codeword as taught by Kim in the satellite communication of Christodoulides so that a smaller and simplified hardware would be used to generate the codeword at different coding rates, that is, for the input of different information bits reduces the number of required encoders, simplifies the encoder and decoder structure, and as a consequence, decreases their size.

9. Claims 8 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christodoulides in view of Raleigh and Kuznicki, as applied to claims 1 and 12 above, further in view of Love et al. (US 7,158,482 B2).

The modified satellite communication of Christodoulides discloses the framing information. However, the modified satellite communication of Christodoulides doesn't explicitly the framing information specifies a modulation scheme, and a coding scheme.

Love teaches the framing information specifies a modulation scheme, and a coding scheme (Fig. 4; col. 5, lines 55-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate framing information or field indicating modulation and coding schemes as taught by Love into the modified satellite communication of Christodoulides in order to improve data throughput of the system, and properly demodulate and decode the data streams.

***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kibrom T. Hailu whose telephone number is (571)270-1209. The examiner can normally be reached on Monday-Thursday 8:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Q. Ngo can be reached on (571)272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kibrom T Hailu/

Examiner, Art Unit 2616

/Ricky Ngo/

Supervisory Patent Examiner, Art Unit 2616

/Ricky Ngo/

Supervisory Patent Examiner, Art Unit 2616